WHAT IS CLAIMED IS:

1. An isolated polynucleotide comprising a nucleotide sequence selected from the group consisting of:

(a) the nucleotide sequence of SEQ ID NO:1;

(b) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2;

(c) a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:3;

(d) a nucleotide sequence encoding a fragment of the amino acid sequence of (b) or (c) having GM4,6D activity;

(e) a nucleotide sequence capable of hybridizing with the sequence of (a) which encodes a peptide having GM4,6D activity; and

(f) allelic variants of the sequence of (a), (b) or (c).

2. An expression vector comprising the polynucleotide of claim 1 and an expression control sequence.

3. A host cell transformed with the vector of claim 2.

4. A process for producing a GM4,6D, said process comprising:

(a) establishing a culture of the host cell of claim 3 in a suitable culture medium; and

(b) isolating said enzyme from said culture.

5. A composition comprising a peptide made according to the process of claim 9.

6. A composition comprising a peptide encoded by the polynucleotide of claim 1.

7. A composition comprising a peptide comprising an amino acid sequence selected from the group consisting of:

(a) the amino acid sequence of SEQ ID NO:2;

(b) the amino acid sequence of SEQ ID NO:3; and

(c) a fragment of the amino acid sequence of (a) or (b) having GM4,6D activity;

said peptide being substantially free from association with other proteins.

8. A pharmaceutical composition comprising the peptide of claim 7 and a pharmaceutceutically acceptable carrier.

9. A method for identifying an inhibitor of GM4,6D activity, said method comprising:

(a) combining a substrate, a candidate inhibitor compound, and a composition comprising a GM4,6D peptide; and

(b) observing whether said GM4,6D peptide converts said substrate.

10. An inhibitor of identified according to the method of claim 9.

11. A pharmaceutical composition comprising a therapeutically effective amount of the inhibitor of claim 10 and a pharmaceutically acceptable carrier.

12. A method of reducing inflammation comprising administering a pharmaceutical composition of claim 11 to a mammalian subject.

13. A composition comprising an antibody which binds to the peptide of claim 7.

14. The polynucleotide of claim 1 comprising the nucleotide sequence of SEQ ID NO:1.

15. The polynucleotide of claim 1 comprising a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:2.

16. The polynucleotide of claim 1 comprising a nucleotide sequence encoding the amino acid sequence of SEQ ID NO:3.

17. The peptide of claim 7 comprising the amino acid sequence of SEQ ID NO:2.

18. The peptide of claim 7 comprising the amino acid sequence of SEQ ID NO:3.

19. A method of treating or ameliorating diseases affected by the level of cellular fucosylation comprising administering a pharmaceutical composition of claim 11 to a mammalian subject.

20. A method of treating or ameliorating diseases affected by the fucosylation of glycoconjugates comprising administering a pharmaceutical composition of claim 11 to a mammalian subject.